

practicable scheme in my paper in the 'Proceedings of the Zoological Society' for 1868 (p. 118), entitled "Observations on Dr. Gray's 'Notes on the arrangement of Sponges, with the description of some new Genera,'" I should not have taken any notice of his paper had he not repeated himself for the second or third time in endeavouring to enhance himself in his own and others' esteem by very considerably deploring my shortcomings in anatomy and physiology:—"as Dr. Bowerbank had no preliminary study of anatomy, many of his ideas are most crude and not consistent with physiological knowledge." It is a well-known legal instruction to counsel, that "if you find that you really have no case, then abuse plaintiff's attorney." A similar course seems to be that adopted by Dr. Gray. It is very true that I did not attend the lectures at which Dr. Gray attained his knowledge of anatomy and physiology in his youth, and that I studied those sciences in my own way, and that the results of our respective modes of attaining knowledge have led to very opposite conclusions,—Dr. Gray's to his publishing (Gray's 'British Plants,' vol. i. p. 362) all the British sponges then known as British plants, and to his describing the *siliceous* spicula of *Tethea pilosa* as *hairs*; while my course of studies led me to the conclusion that sponges were animals.

Dr. Gray's mode of concocting a new arrangement of the Spongiadæ by means of the forms of their spicula is a very facile one—far easier than examining more than a thousand specimens to gain a knowledge of their various forms and their positions *in situ*. Dr. Gray asked me to give him a copy of my works on sponges, which I did with pleasure; and he then cut up the plates and arranged the figures according to his own fancy, and in doing so he succeeded in making four new genera and four new species out of the spicula of two sponges, never having at that time seen a scrap or a spiculum of either of them (see Proc. Zool. Soc. 1868, p. 129). This mode of proceeding is quite after the old adage of "making your hay with other people's grass."

BIBLIOGRAPHICAL NOTICES.

Andrew Garrett's '*Fische der Südsee*,' beschrieben und redigirt von ALBERT C. L. G. GÜNTHER. Heft I. 4to. Hamburg: L. Friedrichsen & Co., 1873.

WE are accustomed in this country to see merchants and others engaged in various departments of trade or in professions devoting

their leisure to scientific investigations, and often with results of the greatest value. In fact nothing can exceed the *naïve* surprise with which foreign *savants* usually receive the information that some of our most distinguished naturalists hold no Professorship or other recognized scientific position, but that they are simply private individuals. In some cases, however, those of our more wealthy countrymen whose tastes lead them to cultivate some particular department of science not only occupy themselves personally with such studies, but also adopt another course, which is perhaps rather more comprehensible to the minds of our neighbours across the channel: they contribute freely from the wealth which their regular avocations bring them to assist and encourage poorer workers in the same field, or to bring forth the results of investigations which would otherwise be prevented from appearing on account of the cost of publication.

But although much has been done in this way, individually and collectively, in England, we cannot point in this country to any such munificent patrons of science as Cesar Godeffroy, of Hamburg. This gentleman, belonging to a firm of great merchants and shipowners, trading to the far east, and especially to the islands scattered over the Pacific Ocean, some years ago conceived the notion of making the extended commerce of his firm a means of founding a museum of natural history in his native city; and having begun by accumulating such specimens as were brought home by the officers in command of their ships, he soon enlarged the plan by sending out competent collectors to various places, and intrusting the care of the valuable specimens thus obtained to naturalists of high attainments.

As an outcome from these researches, this gentleman commenced in the year 1871 the publication of a journal in large quarto, intended to contain communications relating to the geography, ethnography, and general natural history of the countries visited by the Godeffroy collectors; and of this journal, which is most liberally illustrated, the work of which the title stands at the head of this article forms the third part.

From the preliminary statement given by the author, Dr. Günther of the British Museum, it appears that towards the end of last year Hr. C. Godeffroy received a collection of about 470 figures of fishes, coloured from the life by Mr. Andrew Garrett during a residence of several years as a natural-history collector in the Sandwich and Society Islands and in other parts of Polynesia. These drawings (which confirm the account given by Cook in the history of his last voyage of the magnificence of the fishes observed about the coral-reefs of Palmerston Island), and the colours of the fishes especially, are reproduced with the greatest patience and truthfulness—Dr. Günther, when asked to undertake the determination of the species, having ascertained, by the comparison of many of them with other figures also taken from the life, that Mr. Garrett's drawings were perfectly trustworthy in this respect. As regards the structural characters of the objects represented, and especially the number and direction of the rows of scales, the drawings were hardly so satisfactory; and these details had to be corrected by comparison with pre-

served specimens. Convinced by these comparisons of the great scientific value of the materials in his hands, Hr. Godeffroy resolved to spare neither trouble nor expense in rendering it generally serviceable to ichthyologists; and accordingly Dr. Günther undertook to determine the species and edit the work, whilst the services of Mr. Ford were secured to reproduce the drawings.

Like many other undertakings of the same kind, this also took a wider scope as it advanced. It was found that Mr. Garrett's series of drawings included so large a proportion of the known fishes of the South Sea, and that the specimens from the same region accumulated in the British Museum and the Museum Godeffroy furnished such abundant materials for the task, that the temptation became irresistible to a naturalist like Dr. Günther to render his work a complete account of all the species belonging to the fauna which he was called upon to illustrate. Accordingly he decided to give an enumeration with descriptions of all the known fishes of the South Sea, including under that denomination the sea containing the Polynesian and Micronesian groups of islands, but excluding the Fiji Islands and the whole of Melanesia, where an Australian fauna is distinctly recognizable.

That we have dwelt so long on the origin and history of this valuable work is due to two causes. In the first place its general scope and bearing are best indicated by means of a recapitulation of the circumstances which led to its production; and, secondly, a purely descriptive book of this kind gives but little opening either for laudation or criticism. When completed it will form a faunistic contribution of the greatest value, equalling or perhaps exceeding in importance the author's previous labours of the same nature—his 'Reptiles of British India' and his 'Fishes of Zanzibar.'

The part now before us (the first of ten) includes notices of about forty-five species of Serranidæ, five of which are described as new. Five others—namely, a *Serranus*, a *Mesoprion*, an *Ambassis*, and two species of *Apogon* (the last described from Godeffroyian specimens)—appear to be peculiar to the Polynesian region; of the rest, the majority have a very wide distribution, many of them stretching from the Red Sea to Polynesia; and some of these are also taken on the coast of Australia, but none appear to be specially Australian forms. On the other hand, eleven species (four of which belong to *Apogon*) are inhabitants of the Indian archipelago and the seas to the east of Asia. The most curious case of distant isolated distribution is that of *Aprion virescens*, which has the Seychelles as its sole recorded western habitat, but occurs also in the Society and Sandwich Islands and at the Fijis.

The only important change in a systematic point of view made by Dr. Günther in the present part is the establishment of a new main section of *Acanthopterygii Serraniformes* by the division of his old group *Acanth. Perciformes*. He states that in the Serraniformes the vertebral column consists of only about twenty-four vertebrae, of which ten usually belong to the trunk, and fourteen to the tail. The number of vertebrae is much greater in the true Perciformes

To us it seems that the desirability of this change is very questionable. To make up for this, Dr. Günther reunites his *Pristipomatidæ* with the *Serranidæ*.

Before taking leave of this book we must say a few words as to the illustrations. Mr. Ford's power of representing fishes is so well known that it is almost a work of supererogation to say that these figures of South-Sea fishes are beautifully drawn; and, in fact, the structural details are represented with a delicacy and accuracy which leave nothing to be desired. But in most cases the plates are worked in colours; and these have generally been most admirably managed, the brilliant and delicate tints of the beautiful Basses and Apogons coming out wonderfully, and rendering the mere contemplation of the plates a real gratification. We look forward with pleasure to the continuation and completion of this most valuable work, which will form a worthy monument at once to the talents and industry of the author and artist and to the liberality of the founder and supporter of the Museum Godeffroy.

The Recent and Fossil Foraminifera of Belgium. By MM. H. J. MILLER and E. VANDEN BROECK. (*Les Foraminifères, &c.*) 8vo. pp. 34 and Tables. Brussels, 1873.

This memoir, reprinted from the 'Annals' of the Malacological Society of Belgium, is the first part of an intended monograph of the Foraminifera of Belgium. It consists partly of an Introduction, treating of the gradual progress made by naturalists in the study of these Rhizopods, and more particularly of what is known of the presence of fossil Foraminifera in the several Belgian formations from the Lias to the Pliocene inclusive. Thus, in the Lias (Lower) there are 11 species known; in the Aachenian stage of the Cretaceous system, 0; in the Hervian, 11; Nervian, 1; Senonian, 92; Maestrichtian, 76. In the Tertiary Montian and Heersian, 0; Landenian, 6; Ypresian, 11; Paniselian, 1; Bruxellian, 3; Laekennian, 9; Tongrian, 1; Rupelian, 4; Bolderian, 0; Diestian, 70; and in the Scaldisian, 8.

Part I., on the existing Foraminifera of Belgium, follows, commencing with a list of littoral species collected at Sluys-Kill, Ostend, and Nieuport. The first-named place is a little beyond the frontier, on a shallow sea-creek full of animal and vegetable life, and swarming with Foraminifera, the different groups of which at different depths and localities can be reached by wading, and collected separately. Our authors have detected many fossil specimens, derived from neighbouring Diestian and Scaldisian strata, among the recent fauna; and they have given a list of them (p. 27), in which they have had the aid of Messrs. Jones and Parker. Sluys-Kill typifies the muddy littoral zone; whilst the sandy zone is to be studied at Nieuport, Ostend, Blankenberg, Heyst, and along the coast generally. On the sand zone strong shells of *Polystomella crispa*, *Rotalia Beccarii*, *Triloculina oblonga*, *Quinqueloculina bicornis*, &c. are common; whilst the delicate *Lagena lavis*, *L. sulcata*, *Poly-*